



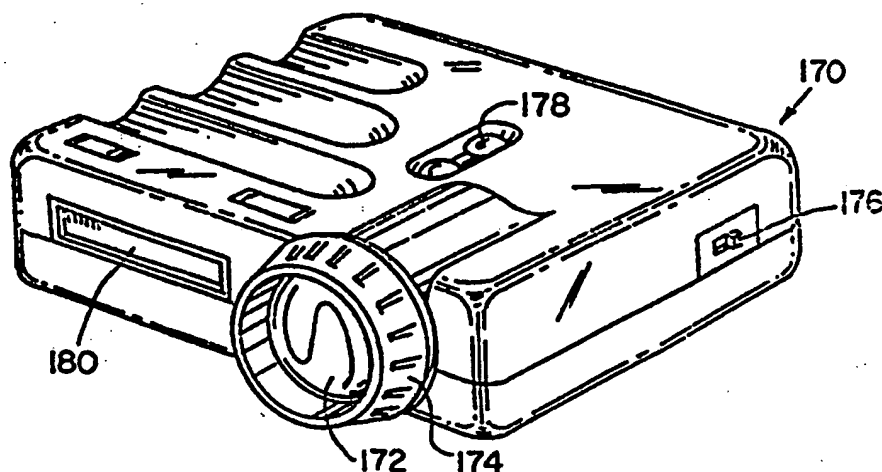
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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|--|--|--|---|
| (51) International Patent Classification <sup>6</sup> :<br><b>H04M 1/02, 1/72, G02B 27/02, G02F 1/13</b>   |  | <b>A3</b>  | (11) International Publication Number:<br><b>WO 98/19435</b>  |
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| (21) International Application Number:<br>PCT/US97/20171   |  | haven Lane, San Jose, CA 95121 (US). RICHARD, Alan [US/US]; 20 Melanie Lane, Wrentham, MA 02093 (US). CHERN, Wen-Foo [US/US]; 28 Country Corners, Wayland, MA 01778 (US).  |   |
| (22) International Filing Date:<br>31 October 1997 (31.10.97)  |  | (74) Agents: HOOVER, Thomas, O. et al.; Hamilton, Brook, Smith & Reynolds, P.C., Two Militia Drive, Lexington, MA 02173 (US).  |   |
| (30) Priority Data:  |  | (81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). |   |
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| 08/942,272 30 September 1997 (30.09.97) US   |  |  |   |
| (63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Application  |  |  |   |
| US 08/942,272 (CIP)  |  |  |   |
| Filed on 30 September 1997 (30.09.97)  |  |  |   |
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| (72) Inventors; and  |  |  |   |
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(54) Title: MICRODISPLAY FOR PORTABLE COMMUNICATION SYSTEM

(57) Abstract

The invention relates to a microdisplay system that utilizes a small high resolution active matrix liquid crystal display with an illumination system and a magnifying optical system to provide a display for a portable communication device. A handset for the communication system incorporates the display for use as, for example, a wireless telephone or paging device. The small display can provide a high resolution color image at low power thus providing for portable battery powered operation.



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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 97/20171

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 H04M1/02 H04M1/72 G02B27/02 G02F1/13

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H04M G09G H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No.                         |
|------------|--|---|
| X          | US 5 486 946 A (JACHIMOWICZ ET AL)<br>23 January 1996                              | 1,4,7,<br>12-14,<br>30,33,<br>36,41,<br>43,84 |
| Y          | see column 3, line 34 - column 11, line 9;<br>figures 1-10                         | 73,76-83                                      |
| A          |  | 15-29,<br>44-58,<br>85-104                    |

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

12 November 1998

Date of mailing of the international search report

3. 12. 98

Name and mailing address of the ISA

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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 97/20171

| C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT |  |  |
|--|--|--|
| Category *   | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No.  |
| Y<br>A   | GB 2 289 555 A (NOKIA MOBILE PHONES LTD)<br>22 November 1995<br>see page 2 - page 14; figures 1-9  | 73,76-83<br><br>2,3,6,9,<br>12,14,<br>31,32,<br>34-36,<br>38,41,<br>43,100 |
| X  | US 5 539 554 A (LEBBY ET AL) 23 July 1996<br><br>see column 3, line 43 - column 10, line 48; figures 1-9   | 1,4,7,<br>12-14,<br>30,33,<br>36,41,<br>43,84                              |
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|  | -/--   |  |

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 97/20171

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document, with indication, where appropriate, of the relevant passages                                    | Relevant to claim No.                              |
|----------|---|--|
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| E        | EP 0 817 393 A (MOTOROLA INC)<br>7 January 1998<br>see column 3, line 53 - column 9, line 41;<br>figures 1-7<br>----- | 62   |

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 97/ 20171

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-58,73-104

Electro-optic packaging of an LCD microdisplay for the purpose of miniaturization in a portable electronic equipment

2. Claims: 59-61

Display control circuit for the purpose of selecting a video or an inverted video signal to be sent to the display

3. Claims: 62-72

Docking system for a telephone with interconnecting means for the purpose of transmitting image data from the telephone to a display integrated in the docking station

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 97/20171

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
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